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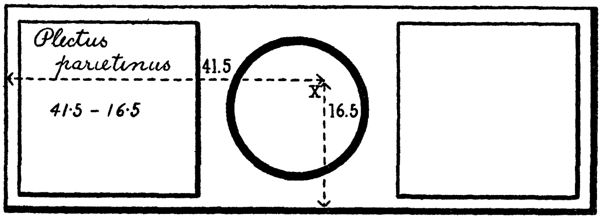
Against certain small objections may be urged a considerable number of practical points. First, the *point of origin is a natural one,* fixed, not registered, that exists on every rectangular slide regardless of its size; in a certain sense therefore it is not arbitrary. Second, it is possible to locate objects, approximately at least, *without mechanical apparatus.* This is of importance to a vast number of microscopists who have few accessories. Third, *any point on the slide* is indicated by figures having a positive sign.



To one having a plain simple stage without any other accessories than spring clips it is possible by this system to find the coördinates of an object by the following simple method.

Take a piece of *thin* paper about ten centimeters long by four centimeters wide, or larger, and make a pinhole near the middle. Clamp this paper to the stage with the clips, and bring the pinhole to the center of the microscope field. Place the slide on the paper, turn on a strong light, and it will generally be found that the object can be examined in this fashion. When the object is found, place it centrally in the field, see that the pinhole is also central, and with a sharp pencil point trace the lower and left hand edges of the slide. Finally measure the distances from the pinhole to these two lines. These measurements will be the coördinates desired. To find an object given its coördinates, reverse the process.

ENTOMOLOGICAL NOTES

Stylops and Stylopization.—Smith and Hamm ('14, Quart. Journ. Micr. Sci., N. Ser., 60: 435-461) find that in spite of the fact that active, winged males of *Stylops* exist, fertilization cannot occur and development is always parthenogenetic. This parasite causes a reduction of about three-fourths in the size of the ovaries of the host bee and no ripe ova are ever produced. The testes are usually not affected, and ripe, normal spermatozoa may be formed. The parasitized female bee usually has a reduced scopa and rarely, if ever, collects pollen.

Oögenesis.—Dederer ('15, Journ. Morph., 26: 1-42) presents the results of a study of the oögenesis in *Philosamia cynthia.* Thirteen chromosomes occur in the pronuclei, thus making the somatic number twenty-six. No satisfactory evidence as to the presence or absence of an X-Y pair of chromosomes was secured. No differential divisions were found in the oögonia. The nuclei of the future nurse cells show evidences of preparation for division although the chromosomes disintegrate, forming numerous granules which arrange themselves near the much infolded nuclear wall. The nurse cells contribute material to the egg cell by means of tubes. Amitosis was not observed among the germ cells. During most of the growth period the egg nucleus is in the spireme stage.

Size Dimorphism in Spermatozoa.—Zeleny and Faust ('15, Journ. Exp. Zool., 18:187-240) report the results of a study of size differences in the length of the head of spermatozoa from single testes in fifteen species of animals, of which ten are insects representing five different orders. Long series of measurements yield evidence that the population of spermatozoa is composed of two size groups, due to the difference in chromosomal content. These groups are not wholly distinct. The distribution curve in each species usually showed two high points or modes, and a comparison of the degree of separation of these modes with the expected degree secured by calculations on chromosomal histories shows a significant correspondence.

Termites.—Snyder ('15, U. S. Dept. Agr., Bureau of Ent., Bull. No. 94, Part II) reports the results of a study of the biology of the termites of eastern United States. The scope of the investigation was broad, and important data were secured on communal organization, castes, life cycle, cannibalism, different forms of nest, establishment of new colonies, parasites, termitophilous insects, etc. A few of the important facts revealed by this study are as follows: The life cycle of *Leucotermes* is highly variable. New colonies may be established by three groups of individuals, (1) the sexed colonizing adults which swarm and leave the colony, (2) neoteinic royal individuals "produced from nymphs of the second form which never (?) leave the parent colony, or from young larvæ, as in colonies orphaned after the nymphs of the first form have nearly completed their development", (3) neoteinic reproductive forms "supplied to orphaned colonies, which may be derived from nymphs of the first or second forms, or larvæ". A bibliography of about forty titles is given.

Wood-boring Trichoptera.—Lloyd ('15, Psyche, 22:17-21) describes a new species of caddis-fly *(Ganonema nigrum)* from Ithaca, N. Y., the larvæ of which have case-making habits which differ greatly from those of other described American trichopterous larvæ. They bore into the solid wood of twigs, heavy bark, or fragments of broken wood on the stream-bottom and use the tunneled wood as portable cases. The food consists of finely pulverized wood. These larvæ are apparently as active in midwinter when the temperature is 20° Fahr., as in midsummer. The writer has found similar cases in streams in Colombia, S. A. Attention is called to Hudson's record (1904) of a species of similar habits in New Zealand.

Egg Concealment.—Hegner ('15, Psyche, 22:24-27) reports results of experiments on the eggs of the potato beetle *(Leptinotarsa decemlineata)* to determine the reasons why eggs are laid on the lower surface of the leaf rather than the upper. The data show that eggs in various stages of development, if kept in direct sunlight, are not retarded in their development but are prevented from hatching, due, probably to partial desiccation. While the advantage of concealment is, no doubt, important, the advantage secured by protection from the desiccating influence of sunlight is the vital one.

Proventriculus of Hydropsychid Larvæ.—Noyes ('15, Journ. Ent. and Zool., 7:34-44) finds that in the larvæ of the genus *Hydropsyche* (Trichoptera) the well-developed proventriculus is unique in having a large number of distinct comparatively solid, chitinous teeth in the anterior part. Two valves, continuous with the œsophageal valve, occur in the posterior part. The œsophageal valve is open along one entire side. The muscle layers in the fore-intestine do not conform to the usual arrangement in insects but the inner layer is composed of circular muscles and the outer layer of longitudinal muscles. The anterior portion of the organ triturates resistant parts of the food while the posterior portion serves the combined function of a strainer and of a regulator of the passage of food into the intestine.

Spider Poison.—Kellogg ('15, Journ. Parasitology, 1:107-112) summarizes literature and presents discussion of the effects of the poison of spiders belonging to the genus *Latrodectes,* the species of which have been regarded as non-venomous or nearly so by some students of the Araneida. Evidence is given in support of the contention that spider poison is formidable and active in character. Allowing for individual differences in physiological condition in different people, it appears that the poison of *Latrodectes* is capable of producing serious results.

Blood-sucking Muscid Larvæ.—Coutant ('15, Journ. Parasitology, 1; 135-150) reports the finding of the larvæ of *Protocalliphora azurea,* one of the flesh-flies, on the bodies of young crows as parasites. The blood-sucking habit of these larvæ was demonstrated by a microscopic examination of the contents of the alimentary canals which were full of the corpuscles of the crow's blood. Data are presented to support the view that the larvæ are intermittent feeders and the author holds that they do not eat solid flesh, either fresh or decayed. The paper includes a discussion of the anatomy of the larvæ and pupa, the habits, distribution, and chætotaxy of the adult.

Morphology of Thysanoptera.—Peterson ('15, Ann. Ent. Soc. Am., *7*:20-66) presents the results of a detailed study of the anatomy of the head and mouth parts of the Thysanoptera. The interpretation of the asymmetrical mouth-parts of this order is significant. The results of such an intensive morphological study can not be completely summarized here but the following are a few of the important general points: The asymmetrical mouth-parts of thrips are arranged in the form of a cone and are fitted for sucking. Mandibular and maxillary parts are uniformily present and show asymmetry. The greatly reduced tentorium is homologized and renders important aid in the interpretation of the piercing organs. The piercing organs in the two suborders are homologous. The sucking apparatus of the pharynx, the salivary glands and the head glands have been critically studied.

Key to Families of Insects.—Brues and Melander (1915) have published a book entitled "Key to the Families of North American Insects". A brief complete key of the dichotomous type has been constructed and leads to the identification of 483 families. The system of orders adopted is essentially that of Handlirsh, more recently established orders being also included, thus making a total of thirty seven. The chief characters of each order are given. The eighteen plates containing 437 figures of representative insects or their morphological details, the glossary, the index, the pronunciation of the names, and the inclusion of synonyms are useful characters of the book. In spite of the fact that the new system of orders adopted involves a considerable departure from the one commonly used and necessitates a certain amount of readjustment, persons interested in taxonomy of insects will find the book a useful source of information.

New Order of Insects.—Silvestri ('13, Portici Boll. Lab. Zool. Gen. Agr., 7:193-209) describes three species of a very interesting new genus, *Zorotypus,* from the Gold Coast, Ceylon, and Java. A new order, *Zoraptera,* is proposed for the reception of these species, the characteristics being as follows: minute; terrestrial; wingless; agile; predaceous. Body depressed. Antennæ moniliform, nine segments. Eyes vestigial. Mandibles strong. Thorax as long as abdomen. Abdomen with ten segments. Cerci short, conical, one segment. Legs similar; hind femora enlarged; tarsi with two segments. The specimens on which this new order is based are only about 2 mm. long. They occur in rotting, vegetable debris.

Fossil Fungus-Gnat.—Cockerell ('15, Can. Ent., 47:159) describes the first genuine fossil *Mycetophila* found in America. The general appearance and structure are said to be exactly as in the living species, *Mycetophyla punctata* Meigen, but differences in certain details of structure led to the disposal of the form as a new species, described under the name of *Mycetophyla bradenæ.* This fossil was collected from the Miocene shales of Florissant, Colorado. The studies of the European species from Baltic amber of Oligocene age and the American form show that the fossil forms are of the same type as the living ones and it appears that some of the *Mycetophylidæ* have continued through the long lapse of time without evolutionary progress except for the changes in minor specific characters.

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NOTES ON BIOLOGICAL METHODS FROM UNIVERSITY OF ILLINOIS

At the request of the Secretary of the American Microscopical Society the following notes on Biological Methods in use at the University of Illinois have been gathered with an aim toward offering suggestions that might be of value to the readers of the Transactions who are looking for shorter cuts and improved methods in their Biological work. The writer makes no claim of discovery or of originality for the greater part of the methods offered here, in truth many of them are old facts revived while some of them are but modifications of standard biological methods.

For clearing bulky and difficult objects.—The use of synthetic oil of wintergreen as a clearing agent for microscopic mounts of whole objects greatly increases their transparency. Objects which appear opaque after treatment with cedar oil, xylol, or toluol, by the use of synthetic oil of wintergreen become highly translucent. This is especially true in the case of solid parenchymatous animals such as large trematodes, leeches, and planarians. Violent diffusion currents accompanying the transfer from absolute alcohol to the oil may be avoided by running the specimens through a series of mixtures of absolute alcohol and the oil. In most cases three or four such mixtures are sufficient, though for animals with thin body walls and large internal cavities the writer has found as many as six grades necessary at times. From the oil of wintergreen transfer to Canada balsam or damar in xylol on a slide and add coverglass.

Damar as a mounting medium.—Damar dissolved in xylol has many advantages over Canada balsam. Balsam turns a dark brown with age. In mounts of embryos or other objects where considerable volume of the mounting medium is used this change of color soon